

Application No.: 10/074,600

Filed: February 12, 2002

TC Art Unit: 2157

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AMENDMENTS TO THE CLAIMS

1. (currently amended) A data communications network,
comprising:

a plurality of data communications rings, the plurality of
rings including a first ring, a second ring, and a third ring,
wherein at least the second ring is configured for spatial
reuse;

at least one first node coupled to the first ring, the at
least one first node including an end station;

~~— a data communications ring configured for spatial reuse; and
a plurality of nodes at least one second node coupled to the
second ring, the plurality of nodes including first and second
bridges, the first bridge also being coupled to the end station;~~

a first bridge configured to link the first ring to the
second ring; and

a second bridge configured to link the second ring to the
third ring,

wherein the second bridge is operative (1) to learn an
association between the first bridge and the end station coupled
to the first ring, and, (2) upon receiving a packet destined for
the end station: (i) to forward the received packet as a broadcast
transmission on the second ring between the second bridge and the

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first bridge in a manner indicating that the packet is to be examined by each of the at least one second node coupled to plurality of nodes on the second ring, in the event that the association between the first bridge and the end station coupled to the first ring has not yet been learned, and (ii) to forward the received packet as a unicast transmission on the second ring between the second bridge and the first bridge ~~on the ring~~, in the event that the association between the first bridge and the end station coupled to the first ring has been learned.

2. (original) A data communications network according to claim 1, wherein the end station comprises an interworking bridge.

3. (currently amended) A data communications network according to claim 2, wherein the interworking bridge provides transparent LAN services via the second ring to customers connected to external LAN segments.

4. (currently amended) A data communications network according to claim 1, wherein the second ring is a resilient packet ring.

5. (canceled)

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6. (currently amended) A data communications network according to claim 1, wherein the end station is a first end station, and further comprising a second end station, the second end station being coupled to the ~~second bridge~~ third ring, and wherein the first bridge is operative (1) to learn an association between the second bridge and the second end station coupled to the third ring, and (2) upon receiving a packet destined for the second end station: (i) to forward the received packet as a broadcast transmission on the second ring between the first bridge and the second bridge in a manner indicating that the packet is to be examined by each of the at least one second node coupled to the second ring, in the event that the association between the second bridge and the second end station coupled to the third ring has not yet been learned, and (ii) to forward the received packet as a unicast transmission on the second ring ~~to between the first bridge and the second bridge on the ring~~, in the event that the association between the second bridge and the second end station coupled to the third ring has been learned.

7. (currently amended) A data communications network according to claim 6, wherein the first bridge learns the association

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between the second bridge and the second end station by monitoring ~~a~~ the broadcast transmission of the second bridge on the second ring, the broadcast transmission of the second bridge including an identifier of the second bridge as an ingress bridge and an address of the second end station as a source of a message included in the broadcast transmission of the second bridge.

8. (currently amended) A data communications network according to claim 6, ~~wherein the ring is a first data communications ring, and further comprising (i) a second data communications ring configured for spatial reuse, the second ring coupling the second bridge to the second end station, and (ii) a third bridge, the third bridge being coupled to both the first and second and third rings as a backup to the second bridge, and wherein the second bridge is operative to send unicast update messages to the third bridge enabling the third bridge to keep track of the associations learned by the second bridge, and wherein the third bridge is operative upon failure of the second bridge to begin the learning of associations and the forwarding of packets on the first~~ second ring as broadcast or unicast transmissions depending on whether the respective associations have been learned.

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9. (currently amended) A method of operating a data communications network having an end station, a plurality of data communications rings including a first ring, a second ring, and a third ring, at least the second data communications ring being configured for spatial reuse, the end station being a plurality of nodes coupled to the first ring, at least one second node being coupled to the second ring, a first bridge for linking the first ring to the second ring, and a second bridge for linking the second ring to the third ring ~~the plurality of nodes including first and second bridges, the first bridge being coupled to the end station,~~ the method comprising the steps of:

at the second bridge, learning an association between the first bridge and the end station coupled to the first ring; and

at the second bridge, upon receiving a packet destined for the end station: (i) in a first forwarding step, forwarding the received packet as a broadcast transmission on the second ring between the second bridge and the first bridge in a manner indicating that the packet is to be examined by each of the ~~plurality of nodes~~ at least one second node coupled to ~~on the~~ second ring, in the event that the association between the first bridge and the end station coupled to the first ring has not yet been learned, and (ii) in a second forwarding step, forwarding the

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received packet as a unicast transmission on the second ring between the second bridge and the first bridge ~~on the ring~~, in the event that the association between the first bridge and the end station coupled to the first ring has been learned.

10. (original) A method according to claim 9, wherein the end station comprises an interworking bridge.

11. (currently amended) A method according to claim 10, wherein the interworking bridge provides transparent LAN services via the second ring to customers connected to external LAN segments.

12. (currently amended) A method according to claim 9, wherein the second ring is a resilient packet ring.

13. (canceled)

14. (currently amended) A method according to claim 9, wherein the end station is a first end station, and wherein the network further includes a second end station, the second end station being coupled to the ~~second bridge~~ third ring, and further comprising:

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at the first bridge, learning an association between the second bridge and the second end station coupled to the third ring; and

at the first bridge, upon receiving a packet destined for the second end station: (i) forwarding the received packet as a broadcast transmission on the second ring between the first bridge and the second bridge in a manner indicating that the packet is to be examined by each of the at least one second node coupled to the second ring, in the event that the association between the second bridge and the second end station coupled to the third ring has not yet been learned, and (ii) forwarding the received packet as a unicast transmission on the second ring between the first bridge and the second bridge on the ring, in the event that the association between the second bridge and the second end station coupled to the third ring has been learned.

15. (currently amended) A method according to claim 14, wherein the first bridge learns the association between the second bridge and the second end station by monitoring a the broadcast transmission of the second bridge on the second ring, the broadcast transmission of the second bridge including an identifier of the second bridge as an ingress bridge and an

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address of the second end station as a source of a message
included in the broadcast transmission of the second bridge.

16. (currently amended) A method according to claim 14, wherein
~~the ring is a first data communications ring, and wherein the~~
network further comprises ~~a second data communications ring~~
~~configured for spatial reuse, the second ring coupling the second~~
~~bridge to the second end station, and a third bridge, the third~~
bridge being coupled to both the first and second and third rings
as a backup to the second bridge, and further comprising:

at the second bridge, sending unicast update messages to the
third bridge enabling the third bridge to keep track of the
associations learned by the second bridge; and

at the third bridge, upon failure of the second bridge,
beginning the learning of associations and the forwarding of
packets on the first second ring as broadcast or unicast
transmissions depending on whether the respective associations
have been learned.

17. (currently amended) A data communications network according
to claim 1,

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wherein the packet contains first and second information, the first information indicating an identity of at least one of a source node and a destination node of the packet, the second information indicating an identity of at least one of an ingress node and an egress node for the packet, and

wherein the second bridge is operative (2) upon receiving a packet destined for the end station coupled to the first ring:
(ii) to forward the received packet as a unicast transmission on the second ring to the first bridge ~~on the ring~~ in the event that the association between the first bridge and the end station coupled to the first ring has been learned, the first information identifying the end station as one of the source node and the destination node of the packet, and the second information identifying the first bridge as one of the ingress node and the egress node for the packet.

18. (currently amended) A method according to claim 9,

wherein the packet contains first and second information, the first information indicating an identity of at least one of a source node and a destination node of the packet, the second information indicating an identity of at least one of an ingress node and an egress node for the packet, and

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wherein the second forwarding step includes forwarding the received packet as a unicast transmission on the second ring to the first bridge ~~on the ring~~ in the event that the association between the first bridge and the end station coupled to the first ring has been learned, the first information identifying the end station as one of the source node and the destination node of the packet, and the second information identifying the first bridge as one of the ingress node and the egress node for the packet.

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